This height, which has been given by Professor M. A. Pavlow for thirty-six of the best American and European open-hearth furnaces, varies in his table from 500 to 1875

Returning to the formula upon page 64,

$$\sim \quad \frac{?;^2 \sin^2 B}{2g} \quad \frac{273+*i}{t_m+t<}$$

it may be seen that the depth to which the gaseous jet descends increases with the increase in it, that is to say, with the temperature in the heating chamber of the furnace. It is clear that when the chamber is cold, that is, when £* = 0°, H has its minimum value. When tt = t_m, H becomes infinite. This shows that if a certain velocity is impressed upon some of the particles in the midst of a fluid, and if no account is taken of internal friction, the displacement and the duration of the motion of these particles will be infinite.

If the temperature within the chamber of the open-hearth furnace U is not equal to 0° nor to the temperature of the hot gases t_m of the jet of flame, the depth H to which the jet descends will become greater and greater as the difference between t_m — t_t becomes less, that is to say, it will be greatest when the gases filling the chamber are lightest. Thus, for example, a jet of kerosene directed downward into water will penetrate it to a greater depth than it will if directed into mercury. In a furnace chamber filled with hot gases the jet of hot gases will descend to a greater distance than it will into a chamber filled with atmospheric air, cold and heavy.

All those who have assisted at the starting up of an open-hearth furnace know that at first the flame in the cold furnace clings to the roof and drops further and further toward the hearth, as the temperature of the furnace gradually increases. In heating up a new furnace, it is necessary to make the bottom, by

burning it on in place, that is to say, to form it of its different elements, incorporating a small quantity of refractory clay with a silica sand, or a small quantity of basic slag or of dolomite containing from 3 to 7 per cent of magnesium silicate. This bottom cannot be made except at a temperature of from 1600° to 1700°, and it is impossible

(i) Rev. de la Sod etc russe de Mttallurgic, 1910, pp. 169-183.